WHAT IS CLAIMED IS:

1. A method for autofocusing the objective of an optical device onto a target region of a specimen, comprising the steps of:

(a) positioning the specimen defining a plurality of regions in an image field of the optical device;

(b) determining the frequency movements for each of the plurality of regions of the specimen;

(c) defining as the target region the region among the plurality of regions of the specimen which exhibits a predetermined frequency movements value;

(d) determining the vertical distance Z_1 between the objective and the target region;

(e) generating a first signal corresponding to the calculated distance Z_1;

(f) inputting the first signal into an autofocus system unit connected to a focusing device;

(g) activating the focusing device, in response to the first signal; and

(h) focusing automatically the objective using the focusing device.

2. The method according to claim 1, further comprising the steps of:

(i) analyzing an image corresponding to the specimen for the evaluation of a first optically detectable specimen-related change.

3. The method according to claim 2, wherein the type of specimen-related change can be determined from the image, and wherein the method further comprises the step of:

(j) categorizing the specimen-related change into a category selected from the group consisting of fast and slow changes.

4. The method according to claim 2, wherein the type of specimen-related change can be determined from the image, and wherein the method further comprises the step of:

(j) categorizing the specimen-related change into a category selected from the group consisting of brightness and occurrence of reflections.

5. The method according to claim 1, wherein the target region is the region among the plurality of regions of the specimen which exhibits the greatest frequency movements per unit time.

6. The method according to claim 2, further comprising the steps of:

(j) analyzing an image corresponding to the specimen for the evaluation of a second optically detectable specimen-related change; and

(k) weighting each of said first and second optically detectable specimen-related changes to determine the target region.

7. The method according to claim 1, wherein between steps (f) and (g), the method further comprises the steps of:

(f)(1) determining the vertical distance between the objective and a region on the specimen on which the objective is focused, said distance defining a second vertical distance;

(f)(2) generating a second signal corresponding to the second vertical distance;

(f)(3) inputting the second signal corresponding to the second vertical distance into the autofocus system unit; and

(f)(4) comparing the second signal to the first signal to determine whether the second vertical distance is equal to the calculated vertical distance Z_1.

8. The method according to claim 7, wherein if the calculated vertical distance Z_1 and the second vertical distance are not equal, the method further comprises:

(f)(5) subtracting the calculated vertical distance Z_1 from the second vertical distance to define a difference.

9. The method according to claim 8, wherein if the difference is positive, the step (h) includes increasing the distance between the specimen and the objective.

10. The method according to claim 8, wherein if the difference is negative, the step (h) includes decreasing the distance between the specimen and the objective.

11. The method according to claim 1, further comprising the steps of:

(i) identifying objects moving within the image field.

12. The method according to claim 1, wherein the step (b) comprises the steps of:

(b)(1) resolving each of the plurality of regions of the specimen into a corresponding pixel having an X and Y coordinate;

(b)(2) generating, using an image sensor, first electrical signals corresponding to each of the pixels; and

(b)(3) using the first electrical signals corresponding to the pixels to generate a first image representation of the specimen.

13. The method according to claim 12, wherein the first electrical signals corresponding to the pixels are video signals.

14. The method according to claim 12, further comprising the steps of:

(b)(4) generating, using the image sensor, second electrical signals corresponding to each of the pixels;

(b)(5) using the second electrical signals corresponding to the pixels to generate a second image representation of the specimen; and

(b)(6) comparing, for each pixel, the second electrical signal to the first electrical signal to define the frequency movements of the region of the specimen corresponding to the pixel.

15. The method according to claim 14, further comprising the step of:

(b)(7) displaying the frequency movements of each of the pixels in a visual output.

16. The method according to claim 15, wherein the visual output is a three-dimensional histogram having X, Y, and Z coordinates.

17. The method according to claim 16, wherein the X and Y coordinates of the histogram correspond to the X and Y coordinates of the pixels, respectively, and wherein the Z coordinate of the histogram corresponds to the frequency movements at each of the pixels.

18. The method according to claim 17, wherein the pixel having the greatest frequency movements is the target region.

19. An apparatus for automatically focusing an optical system comprising:

an image sensor analysis unit;

an autofocus system unit;

a focusing device; and

a displaceable objective,

wherein the objective is adapted to be automatically moved vertically in response to a signal corresponding to a vertical height between a target region of a specimen and a reference point, wherein the image sensor analysis unit is adapted to send a signal to the autofocus system unit corresponding to the vertical height of the target region, wherein the autofocus system unit is adapted to measure a focus height, wherein the autofocus system unit is adapted to compare the focus height to the vertical height between the target region and the reference point and yield an output corresponding to said comparison, and wherein the focusing device is adapted to move the objective vertically in response to the output of the autofocus system unit.

20. The apparatus according to claim 19, wherein the image sensor analysis unit is a computer.

21. The apparatus according to claim 20, wherein the computer is adapted to detect changes in electrical signals corresponding to distinct regions of the specimen.

22. The apparatus according to claim 21, wherein the computer is further adapted to analyze the changes.